



# **U.S. Army SBIR Commercialization 2002**



**Future Combat Systems**



## Future Combat Systems

The Army is undertaking a transformation into a more responsive, deployable and sustainable force, while maintaining its high levels of lethality, survivability, and versatility. In unveiling this new strategy, GEN Eric Shinseki, Chief of Staff of the Army, stated: “Heavy forces must be more strategically deployable and more agile with a smaller logistical footprint, and light forces must be more lethal, survivable and tactically mobile.”

This new force, called the **Objective Force (OF)**, is intended to meet the full spectrum of present and future Army missions. The cornerstone of the OF capability and the transformation is the **Future Combat Systems (FCS)** Program. This reconfigurable, adaptive system of systems will provide a common baseline capability that increases the Army’s ability to conduct network/collaboration-centric warfare. The Army is working to develop and demonstrate first generation of FCS and all its enabling technologies, within this decade. This transformation has had, and will continue to have, a major impact on the entire Army Science and Technology (S&T) enterprise – to include the SBIR Program.

**“... innovative technologies are invented by creative individuals and small, entrepreneurial companies whose workers truly think outside the box.”**



The Small Business Innovation Research (SBIR) Program taps into the innovation and creativity of the small business community to help meet Army Science and Technology (S&T) objectives. At the same time, participating companies develop technologies, products, and services that they can then commercialize through sales in the private sector or back to the Government. Through SBIR and other similar programs, we now know that the best ideas don't necessarily come from the labs of large corporations or even

our Government labs. Most often, innovative technologies are invented by creative individuals and small, entrepreneurial companies whose workers truly think outside the box.

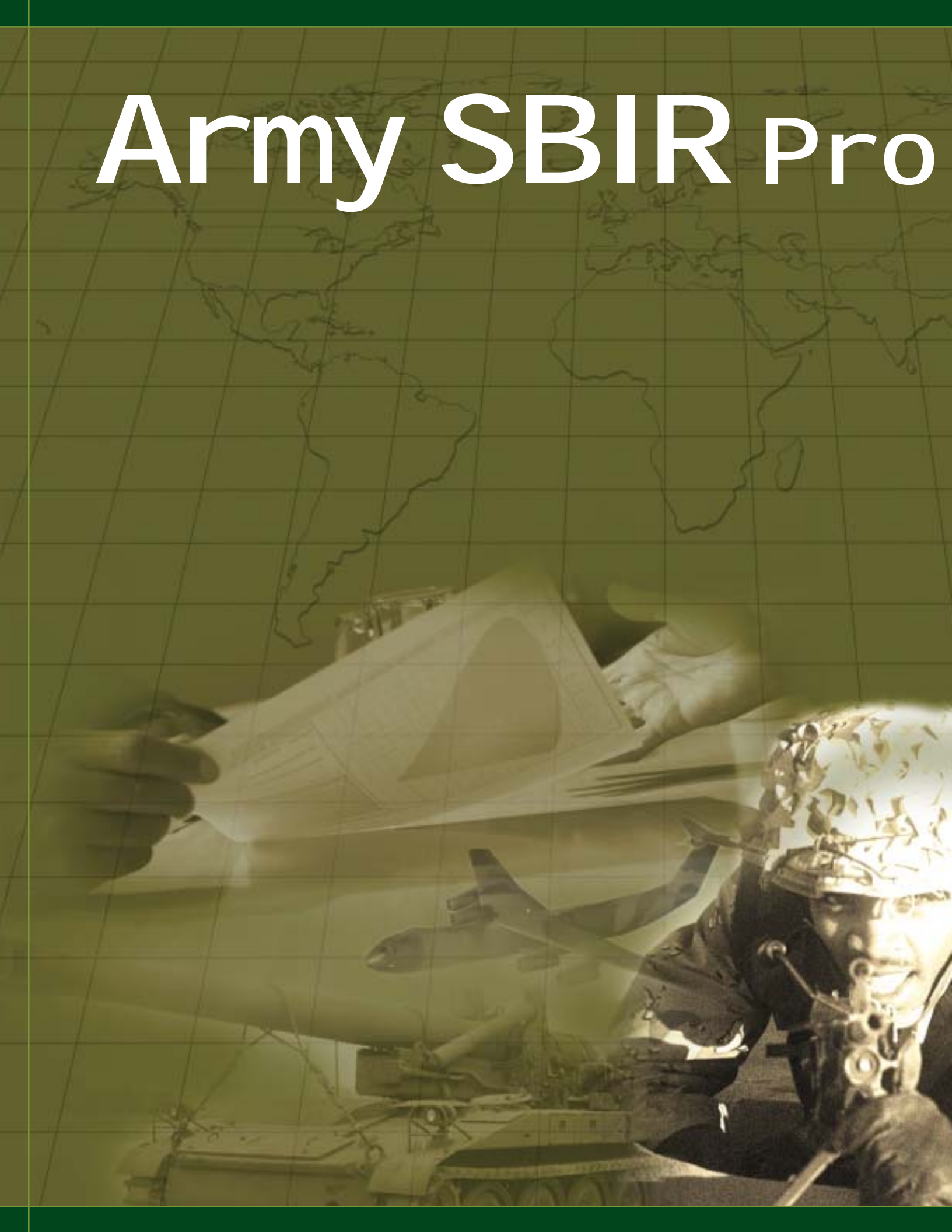
During 2000, the SBIR Program was aligned with Objective Force (OF) and Future Combat Systems (FCS) technology categories – this is an ongoing process as OF/FCS needs change and evolve. With strong participation from the S&T community, there is a greater chance of SBIR successes that will be useful and meaningful to achieving OF and FCS research goals. This, in turn, will lead to increased opportunity for incorporating SBIR projects into the acquisition process.

Creative new ideas often are generated from start-up efforts. We hope that in the future other small businesses — such as those highlighted in this brochure — will spark unique, new concepts that can be transitioned into new technologies that benefit the Army's soldiers, the small business community, and America's economic success.

A handwritten signature in black ink, reading "Kenneth J. Oscar".

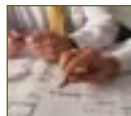
Dr. Kenneth J. Oscar  
*Acting Assistant Secretary of the Army  
(Acquisition, Logistics and Technology)*

# Army SBIR Pro





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**A**rmy scientists and engineers develop SBIR solicitation topics that address current and anticipated warfighting technology needs.

While the DoD publishes two solicitations annually, the Army participates only in the second, or spring, solicitation. Small businesses participate by submitting proposals for Phase I feasibility demonstrations of their innovative solutions to these topics.

Successful SBIR projects move through three phases. As already mentioned, Phase I is the entry point where a company proves the feasibility of its concept in six months for up to \$70,000. An option for up to \$50,000 funds interim Phase I-Phase II activities if the project is selected to receive a Phase II award. Phase II is a substantial R&D effort, up to \$730,000 over two years, which results in a dual-use technology, product, or service. SBIR is very competitive – about one in ten Phase I and one in three Phase II proposals are selected for award.

Phase III, the commercialization phase, is the goal of every SBIR effort. In Phase III, the successful company markets its dual-use product or service either to the Government, the private sector, or both!

The Army is proud to present to you the following SBIR success stories. They describe some of the benefits that the Army, the small business community, and our nation have received through this dynamic program.

- ◆ 3 IHAS networks (Intelligent Hub Access System) have been sold. This sale is comprised of 20 transceivers, 8 multi-beam antennas, controller software, and 20 customer premise antennas generating \$100K in revenue. These systems were sold to Oberon, Inc., a fixed broadband wireless communications value added reseller.
- ◆ 1 patent pending, 5 trademark names resulting from this work
- ◆ Anntron is currently developing a U-NII (Unlicensed National Information Infrastructure) band basestation multi-beam sector antenna, based on the SBIR developed IHAS multi-beam antenna patent, for a commercial communications equipment manufacturer.

## Wireless Wide Area Network



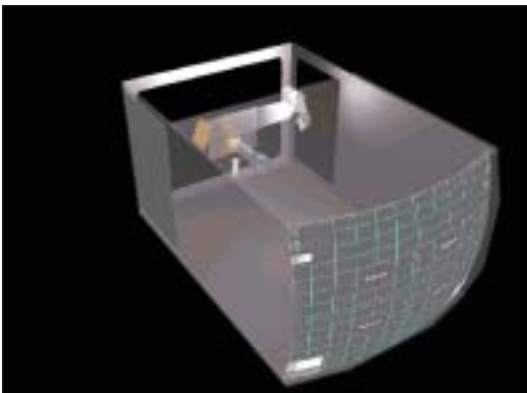
Seamless, wireless, and low-maintenance communication “on-the-move” is a necessity for tactical units engaged in operations around the world, often in remote locations with little or no communication infrastructure. These tactical communication systems are also being asked to carry more data than ever before. In response, Anntron has developed the Intelligent Hub Access System (IHAS) for wireless Wide Area Networks (WANs). Comprised of multi-beam antennas, radio transceivers, and host controller software, the IHAS permits multiple remote stations to communicate with a Network Operations Center Hub. The IHAS connects to a standard Ethernet Local Area Network (LAN) at both the Hub and Remote Stations, and combines angular- frequency and polar- diversity to engage multiple remote stations simultaneously.

The IHAS transceiver uses state-of-the-art architecture and an inexpensive multi-beam antenna that is unique industry-wide to generate six highly directive beams in a 90° sector. Four of the multi-beam sector antennas provide 360° coverage out to a 10-km range. The system has low latency and high data rate network connectivity, and extends the utility of the widely used Switched Ethernet LAN over a 10-km<sup>2</sup> area.

Commercially, this system answers a tremendous requirement for radio networking equipment by Internet Service Providers and IT managers to create low-cost metropolitan, campus, or WANs that are independent of the hard wire and line infrastructure.

## Digital Display System

The Close Combat Tactical Trainer (CCTT) simulation program, used throughout the Army, was faced with a serious problem with the discontinuation of the 26" Cathode Ray Tube (CRT) monitor which provides the Commander's display. To solve this problem, Diamond Visionics developed a high resolution digital display system that meets or exceeds the technical performance of the 26" CRT, by using Digital Micromirror Display technology. Performance enhancements include improved brightness, reliability, maintainability, and contrast ratio; reduced weight; elimination of electromagnetic interference; and unprecedented flexibility and scalability.



This digital display technology is a viable replacement in all military and commercial training and simulation applications where the now obsolete 26" CRT was used as a fundamental building block for visual display systems. Since the design is scalable, it can be used to replace CRTs of all sizes, including custom requirements for which no CRT currently exists.

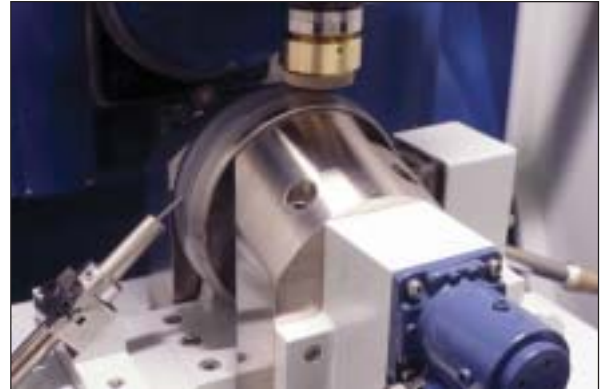
The technology solution provided by Visionics' system allows an external synthetic view of the battlefield in the CCTT. This technology is also applicable to the NASA Space Shuttle, flight simulators, and onboard displays for fixed and rotary-wing aircraft.

Diamond Visionics Company was a recipient of a 2000 U.S. Small Business Administration Tibbetts Award for R&D innovation and a 1999 Army SBIR Quality Award.

- ◆ 775 units sold to date, \$6.9M
- ◆ Awarded a \$10M contract by Lockheed Martin Information Systems to build 1,470 systems for the CCTT program
- ◆ U.S. Patent # 6,134,044
- ◆ \$1M in DoD research funding
- ◆ \$5.9M in non-DoD research funding

- ◆ 50 units sold to date, generating over \$10M in revenue
- ◆ Customers include: Carl Zeiss, Inc.; Eastman Kodak, Inc.; Jenoptik; Leica Camera; Newport; Tropel; and Zygo
- ◆ \$700K in DoD research funding

## Finishing Precision Optics



Close-up of the MRF work zone

**M**agnetorheological Finishing (MRF) technology consists of using a magnetorheological fluid – a unique “intelligent” material that is a suspension of magnetic particles and polishing abrasives – as a compliant polishing tool to replace the specialized rigid laps used in conventional non-deterministic polishing processes. Unlike the conventional rigid lap, the MRF fluid’s shape and stiffness can be magnetically manipulated and controlled in real time to create a pressure spot that is capable of polishing and correcting any optical surface shape. The optic’s final surface form and figure are precisely predicted and realized through the use of computer algorithms that map and control material removal across the entire work piece surface,

allowing MRF application to any optical element. MRF eliminates costly specialized tooling and provides a surface finishing solution that works equally well on spheres, aspheres, and flats.

MRF is an enabling technology for the semiconductor industry and a production-ready solution to facilitate large-scale production of ultra-high precision-fused silica and calcium fluoride lenses. MRF has revolutionized the optics industry by achieving the capability to polish high precision glass aspheres within the production process. MRF has achieved international success.



Interferograms of an optical surface before MRF and after MRF



## Efficient Potable Water

The availability and handling of potable water on the battlefield is a very real operational concern.

Depending on the circumstances, each soldier requires up to a gallon of potable water per day to survive and continue the mission. Added to this, modern equipment water usage can be very demanding. Because of this, RASco designed and built a membrane-based water purification and treatment system called the Reverse Osmosis Multi-Element Module (ROMEM). Through its simplified hydraulic flow paths, the ROMEM allows individual filter element accessibility and replacement, water sampling at each element, reduced membrane fouling, reverse membrane flushing and cleaning, and overall increased ease of assembly and maintenance.

Based on recent contingency operations, the system was initially developed under the Army SBIR Program to improve the Army's water purification equipment. Successful



development of the technology and improved methods of manufacture have allowed RASco to design and build ROMEM water treatment equipment to fit a wide variety of military and commercial applications. These applications include high-speed desalination of seawater; high purity water for semi-conductor/electronics manufacturing; reclamation and recovery of valuable industrial waste products for reuse; clean room humidification; rapid deployment units to meet disaster relief situations; remote small village water purification; and large scale drinking water systems to serve extended populations.



- ◆ 35 units sold to date, generating over \$3.2M in sales
- ◆ U.S. Patent #4,476,015
- ◆ Customers: Department of Interior, Department of Treasury, Department of State, General Services Administration, an IBM/Toshiba Semi-Conductor Plant, Michdan Corporation, and Water Systems International
- ◆ \$3-5M in revenue from current orders expected over the next three years
- ◆ \$130K in DoD research funding
- ◆ \$3.157M in non-DoD research funding

## Realistic Human Behavior

- ◆ *9 separate contracts in place from the Army, Navy, and Air Force to implement CORE technology — more pending, including new commercial customers*
- ◆ *Over \$1.21M in revenue to date*
- ◆ *CORE trademark name and 4 patents pending*
- ◆ *Customers include: U.S. Army Research Institute, U.S. Air Force Research Laboratory, U.S. Navy Space and Naval Warfare Systems Command, DoD Modeling and Simulation Office*
- ◆ *Negotiations in progress for potential international sales to a Korean video game manufacturer*

**V**irtual reality is being used throughout the Army to design and test human interaction with weapons and support systems. One of the most pressing needs in modern simulation systems is realistic human behavior. To support this requirement, Bevilacqua developed a new set of hybrid artificial intelligence tools, called the Cognitive Object Reasoning Engine (CORE), which



allows users to implement deep human cognitive reasoning in computer software more easily than with current methods. The CORE approach solves many of the common problems associated with current complex artificial intelligence systems, making the implementation of large amounts of human cognitive intelligence easier and more maintainable.

CORE is being used across the Department of Defense in Command, Control, Computers, and Information (C4I) systems, decision aids, Modeling and Simulation, and Course of Action Analysis (COAA). CORE has been incorporated within video games to produce truly “intelligent” entities. There have been preliminary discussions with a major Korean video game manufacturer who wants this capability to produce “intelligent” video games that can “learn” to defeat the game player.

Bevilacqua was a recipient of a 1998 U.S. Small Business Administration Tibbetts Award for R&D excellence.

## Short Wavelength Infrared (SWIR) Sensors

- ◆ \$2.8M advanced development contract from the Army
- ◆ Currently developing products for an automation company with projected annual sales of \$1-3M beginning in 2002



Shortwave infrared imaging distinguishes camouflages on different fabrics from vegetation

Passive sensors that provide high quality imagery in limited visibility have played an important role in military operations for decades. Night vision goggles (NVGs) and forward-looking infrared (FLIR) thermal systems – the primary night vision technologies fielded to date – are complementary because they operate in different spectral bands and provide very different scene information. Fermionics developed short wavelength infrared (SWIR) sensors that operate in a spectral band between NVGs and FLIRs and offer unique daytime, low-light level and gated imaging versatility. These SWIR sensors are also digital, high resolution, and low power, enabling multi-spectral target detection and identification, situational awareness and mobility for the Objective Force.

Commercially, SWIR sensors can be tailored for use in spectroscopy, automation, low-light level camcorders and cameras, search and rescue, communications, and manufacturing quality control. SWIR sensors operate in the same spectral band as eye-safe IR illuminators, offering the potential for low-cost driving and navigation aids.



- ◆ *Over \$250K in revenue from Boeing Phantom Works, Lockheed Martin, Orbital Science, and others*
- ◆ *\$199K in DoD research contributions*
- ◆ *\$60K in non-DoD research contributions*

## Missile Design Thermal Analysis

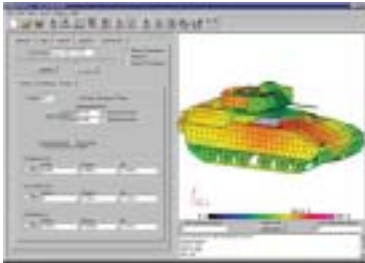


Major advances have been made in component thermal and thermostructural analysis software and desktop computing; however, technological advances in the generation of convection heating and pressure boundary conditions have not kept pace. By modifying existing software, Mesa was able to develop an effective and easy-to-use analysis tool for generating the pressure boundary conditions associated with supersonic and hypersonic flight. This design software can analyze nonaxisymmetric, three-dimensional shape changes resulting from either angle of attack or nonuniform material

roughness. Although this software has already been used by the U.S. Army Aviation and Missile Command (AMCOM) to analyze various missile designs, it is being further tested by Raytheon Corporation and the Naval Air Warfare Center, among others, to make the code easier to use and more efficient. Once this testing and development is completed, it will be fully commercialized by the end of 2001, and has the potential to be used by anyone within and outside the Federal Government responsible for missile and aircraft design.



## Thermal Modeling Software



**T**hermoAnalytics developed a computer-aided engineering software tool that can determine the optimum signature reduced design and the most efficient materials and components to meet vehicle thermal system performance requirements. This tool aids in the assessment of the susceptibility of military vehicles to threat sensors. Among its features are cross-platform functionality and object-oriented programming which allows the program to run on any computer with maximum integration with other military and commercial tools. This product addresses an important need for the Objective Force, specifically the Army's need for next-generation weapon systems and tactical vehicles to be smaller, lighter, and more efficient. In order to meet these goals

and still maintain high survivability, computer analysis tools are being used during weapon/vehicle design phase to optimize the system's performance before it is built and tested.

The product from this technology has use in new commercial products being developed at ThermoAnalytics as well as several fielded military products:

- ◆ The software was chosen to be the thermal signature prediction solver in the fielded Tri-Service Weather Impact Decision Aids program's Targeting Acquisition Weather Software mission planning program.
- ◆ The Army's Night Vision Laboratory is incorporating the software in their "Paint the Night" scene simulation software.
- ◆ The Defense Advanced Research Projects Agency is using the software for model-based recognition algorithms in its Dynamic Database program.



- ◆ 66 units sold to date - \$566K in revenue
- ◆ WinTherm® is a registered trademark of ThermoAnalytics, Inc.
- ◆ \$1.038M in DoD contracts awarded to date
- ◆ \$175K of non-DoD contributions (primarily DOT) and \$410K industry contributions (primarily automobile companies) to date
- ◆ Used by U.S. Army TARDEC in its Future Combat Systems prototype design and signature assessment studies

## Smart Armor Structures

- ◆ 16 educational kits sold, generating over \$200K in revenue
- ◆ \$180K commercial contract for structures evaluation
- ◆ \$407K in contracts with U.S. Navy Air Systems Command, NASA, and Office of Naval Research



**P**roduction Products Manufacturing & Sales developed the capability to measure strain-rate information on the inside of a lightweight composite material vehicle during a ballistic event. The primary technology advancement was the development of a high-speed fiber grating sensor system that operates in the range of 10 kHz to 10 MHz. Because of this development, the Army will be able to design armor to ensure the survivability of future soldiers and their equipment.

The results of this sensor system technology have been incorporated into a commercial product line that includes educational kits and hardware being used in a variety of Department of Defense and commercial applications. The technology has been used to support in-situ bridge and vehicle classification. The Oregon Department of Transportation has identified 800 sites that will use this high-speed traffic classification system.

Production Products Manufacturing & Sales has continued the integration of the sensor system with composite material processing under the Office of Naval Research's Northwestern Intelligent Processing Center. The goal of this work is to substantially lower the cost of manufacturing composite structures by improving consistency, reducing scrap and rework, and shortening the design time by providing essential equipment, sensors, controls, and processing models. The University of Delaware Center for Composite Materials has furthered the technology in its Army Research Laboratory's Center on Lightweight Multifunctional Materials for Composite Armor.

## Virtual Breaker Box

**C**ustom Manufacturing and Engineering, Inc. has developed a virtual breaker box that delivers advanced energy management and control for shelters and vehicles through the use of “smart” circuits and outlets. The virtual breaker box features sensors, data acquisition, a junction box, energy management, fault protection, and automated monitoring and control. The system also provides control across a network within a single platform or across multiple platforms. This enables on-the-fly power protection, load shedding, and energy management for AC and/or DC power distribution systems.

The virtual breaker box significantly improves the quality and quantity of electrical power in tactical platforms, reduces

fuel consumption, improves power source efficiency, and enables the use of environmental control units. Immediate military applications include the Standardized Integrated Command Post System, temporary base camps, field hospitals, and tactical vehicles. Future applications include the FCS; multi-functional, low-power systems in Land Warrior; and unattended ground sensor networks. Near-term, potential commercial applications include yachts, RVs, and industrial buildings.

Custom Manufacturing and Engineering, Inc. was a recipient of a 1999 U.S. Small Business Administration Tibbetts Award for R&D excellence.

- ◆ *1 unit delivered; 8 units ordered; \$32K in revenue — potential for 1000's to be used across the Department of Defense*
- ◆ *Two patents in process*
- ◆ *\$2.25M in DoD research funding*
- ◆ *\$35K in non-DoD research funding*



- ◆ *Over 200 units sold to date and 7000 sold by licensees, generating over \$1.5M in direct revenue and \$2M from licensees*
- ◆ *U.S. Patent #5,403,383*
- ◆ *BIO PLUS® now a registered trademark of Technovation*
- ◆ *Winner of the 1997 R&D 100 Award, 1996 Micro Product All Star and 1995 NASA Technology 2000 SBIR Award*

## High Efficiency Filtration System



**T**echnovation developed an Electrically Enhanced Filtration technology which has been applied to military Nuclear Biological and Chemical (NBC) warfare protection systems. This technology achieved four orders of magnitude higher filtration performance with negligible decrease in flow, resulting in higher protection from lethal and harmful aerosols in a practical manner. In addition to achieving this goal, testing demonstrated that the technology was able to kill many common indoor airborne micro-organisms and to eliminate a variety of lesser contaminants, such as diesel smoke, smoke screens, and rocket exhaust commonly expected in an NBC environment.

The Electrically Enhanced Filtration technology has been successfully applied to residential, commercial and industrial air purification applications and has been licensed for use in HVACs, portable air cleaning applications, and industrial

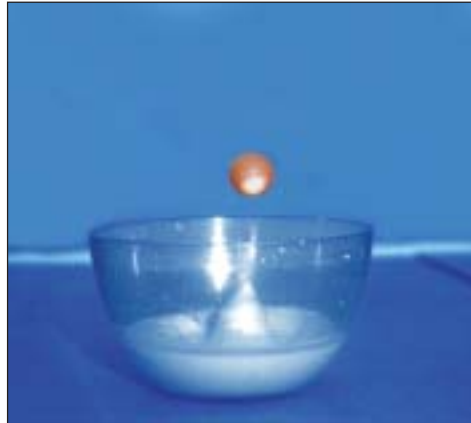
cleanrooms. Technovation cleanroom filters are in use at 60 industrial sites worldwide. This filtration system enables higher efficiency and almost eliminates all airborne bioburden, thus enabling higher purity pharmaceutical and biotech products at a lower cost. It has also been used for hospital isolation (tuberculosis and HIV) rooms with great success. The Electrically Enhanced Filter reduces the spread of infectious airborne diseases and has the potential to make safer pharmaceuticals, biotech products, medical devices and food products.





## High-Speed, High-Resolution Image Sensor

Photobit has developed high-resolution, high-speed, low-power image sensors that are used in applications ranging from missile tracking to making MTV videos. This sensor development began with a need to improve the performance of cameras used to record the details of missile launches on test ranges. This initial work led to the development of megapixel Complementary Metal Oxide Semiconductor (CMOS) image sensors with speeds greater than 500 frames per second and electronic shuttering capability that can freeze even the fastest motion to create high fidelity images. It is expected that the image sensor technology developed under this effort will lead to a near total replacement of film based camera systems on DoD missile ranges.



The Navy has leveraged this effort to build airborne weapon separation monitoring cameras utilizing Photobit sensors. Various commercial applications use these sensors, including industrial machine vision; and high-speed industrial/scientific imaging, biomechanics, and animation systems used for motion pictures, television, and video games. Cameras used for the latter application have been awarded the Television Broadcast Editor's Pick of Show Award at the National Association of Broadcasters and the Computer Graphics World's 2000 Innovation Award; and are also being used to capture motion for feature films such as "The Mummy II" and "Star Wars Episode 2", and other well-known television and video game productions.

- ◆ 1916 units sold to date, resulting in \$1.7M in revenue
- ◆ Four patents filed
- ◆ Customers include Basler Vision Technologies, VDS Vosskuhler, ASTI, and Mikroton
- ◆ Federal Government contribution to R&D - \$8.65M total contract award, of which \$2.36M is funded to date
- ◆ Awarded the EDN "Hot 100 Product of 1999"
- ◆ Multimillion dollar investments from several large companies including Intel and Hitachi to fund Photobit's growth

- ◆ \$1.3M in DoD and Army research funding
- ◆ Patents awarded on optical communication system and virtual reality system
- ◆ Named an R&D100 Award winner and a finalist in the Discover Magazine Awards for Technical Innovation in 2000

### Enhanced Mobility



Combat vehicles must be able to navigate difficult and unfamiliar terrain, respond rapidly to changing mission requirements, and negotiate minefields, battle-damaged terrain and nuclear/biological/chemical release areas. Talking Lights has developed a unique guidance system which allows vehicles to negotiate these hazards with greater accuracy and speed than present technology allows – and with no need for external operator viewing.

The system represents an innovative combination of Smart Marker Lights from Talking Lights with a virtual reality system from Pathfinder Systems. Video cameras provide a view of the outside environment,

which is enhanced by computer-generated, GPS-based terrain and hazardous area markers. At the same time, field-implemented Smart Marker Lights continuously update the view by transmitting data about position, hazards, and the total environment via visual, IR, and RF signals. These markers can also provide information to individual soldiers through palmtop computers. Future enhancements will include active vehicle guidance. The system is to be demonstrated at the Maneuver Support Battle Laboratory at Ft. Leonard Wood, Missouri.

# Opportunities



# Army STTR Program



**T**he Small Business Technology Transfer (STTR) Program funds innovative technologies developed by small businesses partnering with universities, federally-funded research and development centers (FFRDCs), and other non-profit research institutions. Congress established STTR in 1994 as a companion program to SBIR. It is currently authorized through FY 2009. STTR shares the SBIR Program's objectives and processes with a few important differences:

- ◆ STTR provides an incentive for small businesses and researchers to move emerging technologies from the laboratory to the marketplace
- ◆ STTR Phase I efforts can be up to one year in duration, for a maximum of \$100,000
- ◆ STTR Phase II efforts are two-year efforts for up to \$500,000

The U.S. Army Research Office (ARO) is the lead execution agent for the Army STTR Program by virtue of its broad basic research mission within the Army. ARO has developed numerous strategic partnerships with industry and academia to develop new technologies with applications in future Army systems. ARO manages and executes the Army STTR Program while maintaining the dual-use focus mandated by Congress.

## **Participating in Army STTR**

For more information about the Army STTR Program, including upcoming opportunities for participating in the program, visit the Army STTR Web Site at:

<http://www.aro.army.mil/arrowash/rt>

## **STTR Success Story**

While most STTR-funded projects are still too new to have achieved significant commercial success outside the program, the following page provides a recent success story.



## Better Supply Management

- ◆ Revenue in excess of \$4.5M
- ◆ Partnered with Coca-Cola to scale business in one area
- ◆ Technology used to develop VirtECS broadly applicable to Future Combat Systems

**A**dvanced Planning and Scheduling (APS) and Supply Chain Management (SCM) activities consume significant resources, and when done well, offer rewards far in excess of the effort spent. Advanced Process Combinatorics has developed a vertically integrated set of high-powered software tools, called VirtECS, to help perform these tasks. VirtECS offers more courses of action and better solutions to harder problems than available elsewhere and can be expanded at a rate matching that of software technology development.

The core of this system is a unifying representation from which models for any member of the VirtECS Software System family can be driven. The result is that regardless of whether performing Design, Planning, or Scheduling, the data set has an identical base. Each tool augments this base with information relevant only to the task at hand. Streamlined integration has never been easier and the software allows a diverse set of interests (and various levels of detail) to communicate on a common ground. Each VirtECS Software tool is structured to address a different level of detail.



VirtECS has the potential to revolutionize sustainment for the Army through logistics information dominance. This will enable the tactical commander to shorten the operation decision cycle and optimize resources through complete access to automated logistics data down to the lowest level.

# SBIR Phase II Quality Awards

A panel of Army and industry experts select outstanding Phase II projects each year to receive Army SBIR Phase II Quality Awards. These awardees best exemplify the SBIR goal of developing innovative technologies and products, and moving them into the marketplace.

The Quality Awards competition is open to all companies whose Army SBIR Phase II projects conclude in a given fiscal year. Winners are selected based on three criteria:

- ◆ Originality and degree of innovation represented in their research
- ◆ Relevance of the research to an Army mission
- ◆ Immediate commercialization potential of the technology or product

The Army Research Office-Washington executes the awards program each year. Award plaques are presented to the SBIR companies as well as their sponsoring Army organizations. These outstanding projects also receive recognition in an SBIR Phase II Quality Awards brochure, which the Army distributes at conferences and other meetings in which the Army SBIR Program participates. This extra exposure provides additional marketing opportunities for the awardees within the Army, the Department of Defense, and the private sector.



## The 2001 Phase II Quality Award Winners

**Electromagnetic Interference Shielding**  
Ormet Circuits, Inc.  
*U.S. Army Space & Missile Defense Command*

**Barrel Armor**  
TPL, Inc.  
*U.S. Army Research Office*

**Increased Power**  
Lynntech, Inc.  
*U.S. Army Research Laboratory*

**Site-Specific Radio Communication**  
Remson, Inc.  
*U.S. Army Research Office*

**High Resolution Micro-Display**  
eMagin Corporation  
*U.S. Army Communications-Electronics RD&E Center*



# Past Quality Award Winners

## 2000

### **Student-Centered Learning System**

Farance, Inc.  
*U.S. Army Communications-Electronics RD&E Center*

### **Rapid, Effective Malaria Test**

Flow, Inc.  
*Walter Reed Army Institute of Research*

### **Smart Armor Structures**

Production Products Manufacturing & Sales Inc.  
*U.S. Army Research Laboratory*

### **Computer-Aided Design**

ThermoAnalytics, Inc.  
*U.S. Army Research Laboratory*

### **Better Communications**

Cree, Inc.  
*U.S. Army Research Laboratory*

### **Night Driving Simulator**

DCS Corporation  
*U.S. Army Simulation, Training and Instrumentation Command*

### **Detection of Mosquito-Borne Pathogens**

Medical Analysis Systems, Inc.  
*Walter Reed Army Institute of Research*

### **High-Speed Munitions Inspection**

Skiametrics, Inc.  
*U.S. Army Armaments RD&E Center*

## 1999

### **Single Antenna Feed, Multiple Band Satellite Communications**

Austin Info Systems, Inc.  
*U.S. Army Communications-Electronics Command RD&E Center*

### **Remote Triage Sensors**

Empirical Technologies Corporation  
*U.S. Army Medical Research and Materiel Command*

### **Improved Decision-Making Training Aids**

Cognitive Technologies, Inc.  
*U.S. Army Research Institute*

### **Lightweight Digital Display Screen**

Diamond Visionics, LLC  
*U.S. Army Simulation, Training and Instrumentation Command*

### **Pressurized Airbeams**

Federal Fabrics-Fibers, Inc.  
*U.S. Army Natick Soldier Center*

## 1998

### **Two Color Per Pixel Staring Focal Plane Array**

Amain Electronics Company, Inc.  
*U.S. Army Communications-Electronics Command RD&E Center*

### **Extremely Lightweight Fuel Cell Stacks**

Analytic Power Corporation  
*U.S. Army Research Laboratory*

### **Lightweight Monopolar Fuel Cells**

Lynntech, Inc.  
*U.S. Army Research Laboratory*

### **Self-Correcting Neural Sensor Fusion**

Physical Optics Corporation  
*U.S. Army Missile RD&E Center*

### **Feature-Based Rapid Map Generation System**

Vexcel Corporation  
*U.S. Army Topographic Engineering Center*

## 1997

### **Security Using Automated Speech Recognition**

Daniel H. Wagner Associates, Inc.  
*U.S. Army Armaments RD&E Center*

### **Unmanned Aerial Vehicle Guided Landing**

Focused Energy Holding Company  
*U.S. Army Missile RD&E Center*

### **Advanced Engine Protection**

InnovaTech, Inc.  
*U.S. Army Missile RD&E Center*

### **Wear Resistant Coatings**

Materials Resources, Inc.  
*U.S. Army Tank Automotive RD&E Center*

### **Self-Heating Foods**

TDA Research, Inc.  
*U.S. Army Natick Soldier Center*

## 1996

### **Texture True Digital Maps**

Computer Graphics System Development Corp.  
*U.S. Army Topographic Engineering Center*

### **Precision Monitoring**

J.A. Woollam Company, Inc.  
*U.S. Army Communications-Electronics Command RD&E Center*

### **Green Dirt**

Electrokinetics, Inc.  
*U.S. Army Waterways Experiment Station*

### **Virtual Infantry**

Dive Laboratories, Inc.  
*U.S. Army Simulation, Training, and Instrumentation Command*

### **Point and Navigate**

Point Research Corporation  
*U.S. Army Topographic Engineering Center*





# Chemical and Biological Defense (CBD) Program

The DoD CBD Program was established in response to recent world events which caused intense interest in the readiness and effectiveness of U.S. Chemical and Biological warfare defenses. The DoD CBD Program enables U.S. forces to survive, fight, and win in chemical and biological warfare environments. This requires aggressive, realistic training and the finest equipment available to allow soldiers to avoid contamination, if possible, and to protect, decontaminate, and sustain operations.

The DoD CBD SBIR Program seeks to transfer innovative CBD technologies between the Services/Special Operations Command (SOCOM) and the private sector for mutual benefit. The objective is to develop technologies for detection, identification, protection, and decontamination of chemical and biological agents.

- ◆ **Detection** includes both stand-off and point detection of agents in air, water, and soil, as well as in complex media such as food.
- ◆ **Identification** includes molecular techniques for the rapid identification of CB agents for forensics purposes.
- ◆ **Protection** encompasses all areas of non-medical individual and collective protection, including CB hardening of buildings and facilities.
- ◆ **Decontamination** focuses on non-corrosive, environmentally benign processes that can be used on equipment, weapons platforms, and personnel.

Application of CBD technologies will be on battlefield force protection, homeland defense, and treaty compliance and verification. This includes technologies that maximize a strong defensive posture using passive or active means as deterrents.

As the lead agency, the Army coordinates DoD-wide topic generation; receipt, evaluation, selection, and award of Phase I proposals; and potential follow-on Phase II efforts under this program.

To learn more about the DoD CBD SBIR Program, please visit the ARO Web Site:

<http://www.aro.army.mil/arowash/rt>







**T**he Army SBIR/STTR Program conducts an aggressive outreach program to increase small business awareness of broad opportunities provided by the Army. Army SBIR personnel participate in national, regional, and local conferences across the country. This provides small businesses with face-to-face contact with people who are knowledgeable about Army needs and the SBIR/STTR process. The Army SBIR Web Site identifies upcoming events at which the Army will be participating.

The Army SBIR/STTR Web Site provides online access to comprehensive information about the Program :

- ◆ General Information (on participating in the Program)
- ◆ Changes and New Requirements
- ◆ Points of Contact and Links (to other Army programs and related SBIR sites)
- ◆ Proposal Submission (procedures and entry points)
- ◆ Recent Army SBIR Awards
- ◆ Searchable Database of Past Awards
- ◆ Chemical-Biological Defense SBIR Program (Joint Army/Navy/Air Force/SOCOM)
- ◆ Phase III Success Stories
- ◆ Phase II Quality Awards Program

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